



Opportunities and Challenges Green Jobs Fair

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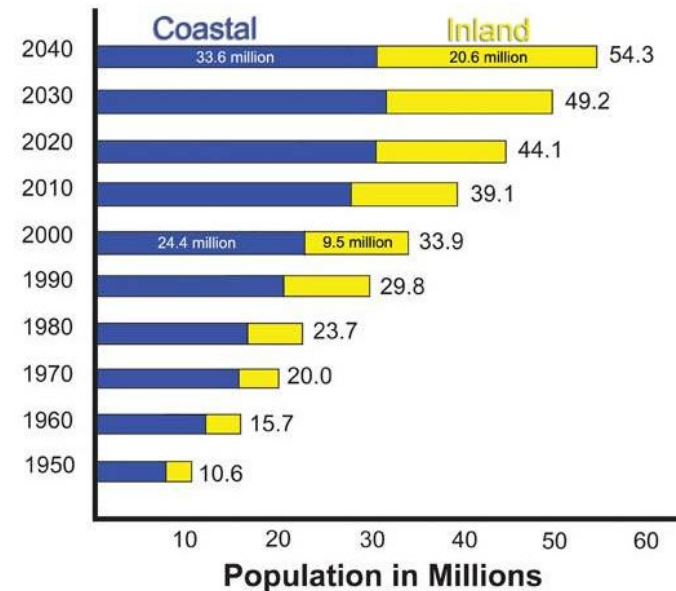
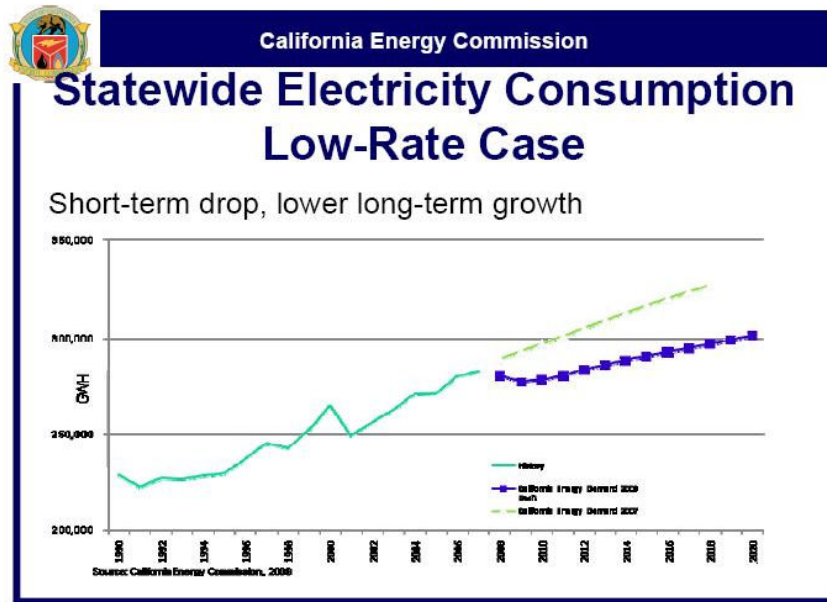
What is CALSEIA?

- **CAL**ifornia **Solar Energy Industries Association**
- Founded in 1977
- Mission: to expand the use of all solar technologies in California and establish a sustainable industry for a clean energy future
- Membership comprised of solar companies: manufacturers, distributors, contractors, engineers, designers, utilities



Energy Challenges Will Persist

- Total demand will grow
- Population moving to locations where cooling is more important
- Climate change will force change in energy consumption
- Climate change will force change in generation choices



The Big Picture Mission

- Lower energy bills for those who need it most
- Health: reducing heat-related illnesses and deaths
- Air quality: natural gas SO_x, NO_x, particulates
- Greenhouse Gas Emissions
- Jobs
- Community based energy
- Fairness



Do it in the Right Order

- Reduce demand (the thermostat setting)
- Energy Efficiency (replace the air conditioner, caulk, insulate, seal ducts, etc.)
- On site energy production
 - Solar Water Heating (SWH)
 - Solar Electric (PV)
- Distributed Renewable Generation
- Utility Scale Generation



Solar Technologies

(in order of cost per kWh or Btu)

- Energy Efficiency (not a solar technology but essential to lowering installed cost of solar technologies)
- Solar thermal (water heating, process energy, space heating, space cooling, pool heating)
- Solar thermal electric generation
- Solar electric Photovoltaic (grid connected/no storage)
 - Polymer (not available in large volume yet, currently lowest efficiency)
 - Thin Film (currently lower efficiency means greater surface area needed)
 - Silicon (highest efficiency means less surface area needed)

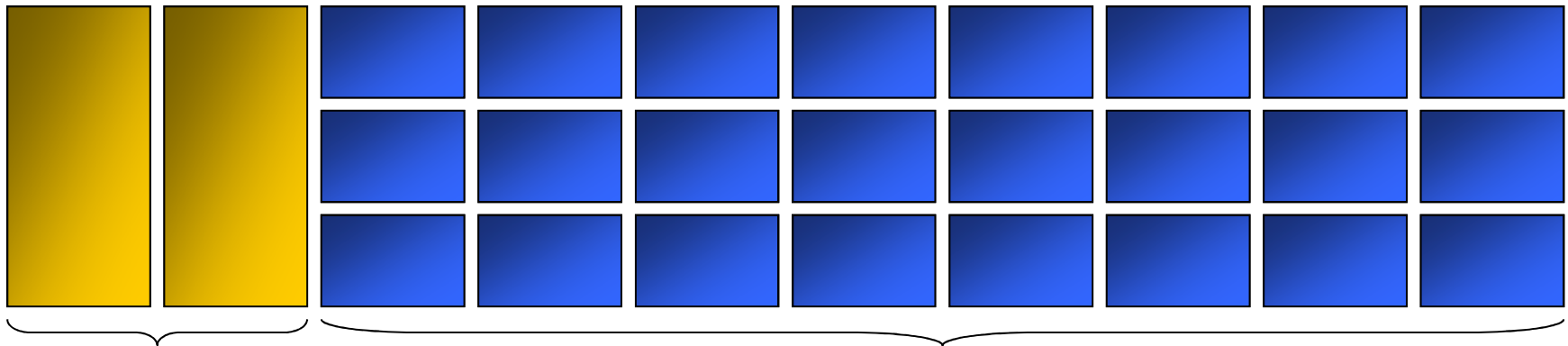


Comparing PV and Solar Thermal

Right Technology For The Job

Hot water needs:
shower, laundry,
dishwashing, etc.

Electricity needs: refrigerator, lighting, plug in devices



SHW (HELIODYNE GOBI 410)

Output/day¹: 22.7 kWh_{th}

Area: 80 ft²

Installed cost: \$7,000

PV (Shell SQ 165-PC)

Output/day²: 22.3 kWh

Area: 456 ft²

Installed cost: \$51,480

← = →

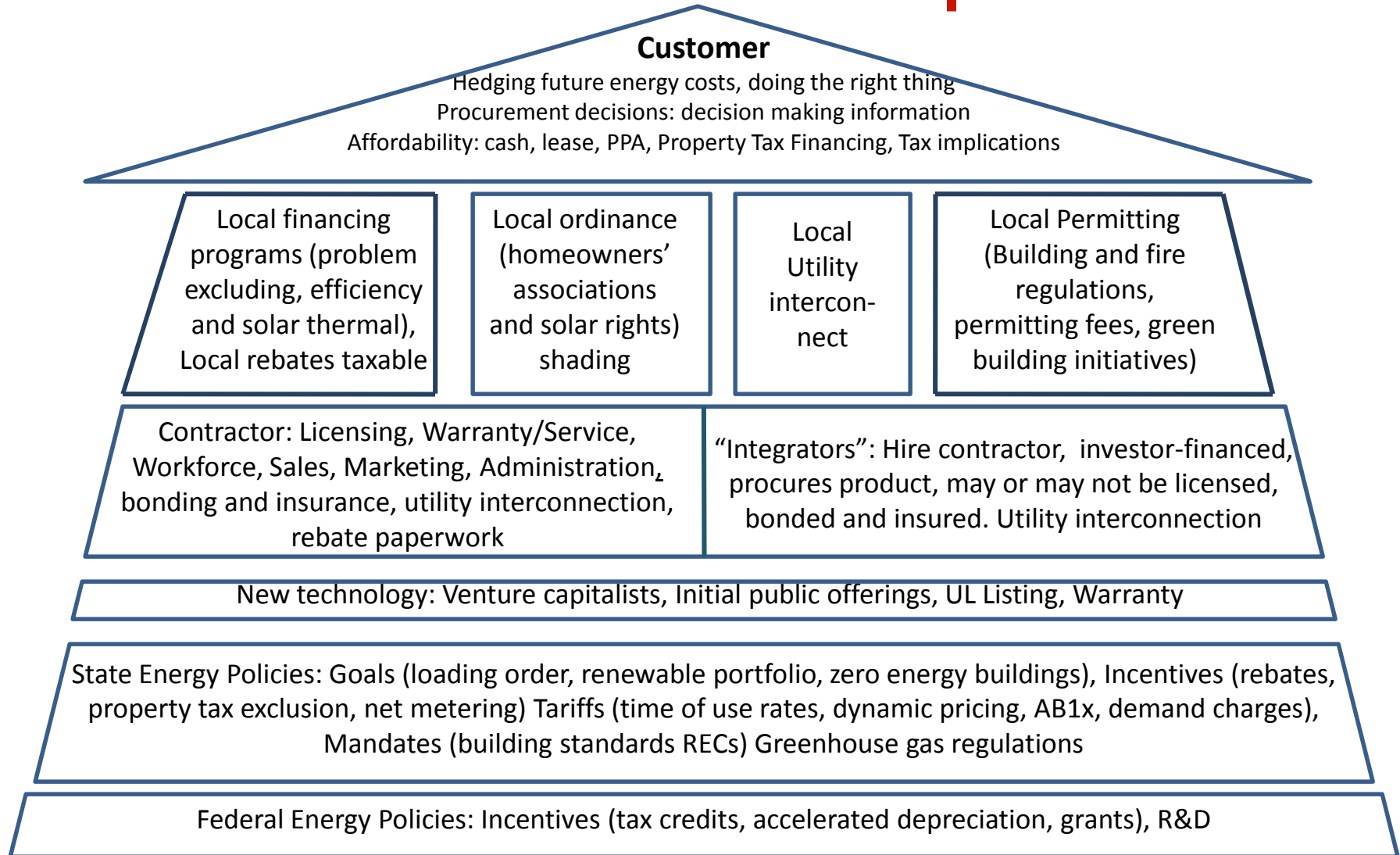
← 1 to 7 →

1: Peak output based on SRCC Category C Clear Sky for SHW (Equivalent kWh derived using 3,414 Btu/kWh)

2: Manufacturers spec sheet for PV at standard test conditions (5.28 kW array rating x 5.8 peak sun-hrs/day)



Solar Business Snapshot



Beware the Hype about those Installation Jobs

- Not as many as the news would lead you to believe
 - Near term sales affected by financial markets for both residential and commercial markets
 - Residential sales affected by job losses, loss of equity, tighter lending markets, loss of homes, fear of debt
 - Solar projects are cyclical and short term projects
 - Solar projects follow the customer

Jan 07-Jan 09 – total number of installations	PG&E	SCE	San Diego
Residential and small commercial (<30kW)	9,226	3,313	1,213
Commercial, non-profit, government (>30kW≤1MW)	637	286	78

14 companies installed more than 60% of these projects

- Manufacturing: Research/start-up companies, silicon chip (San Jose), SolarWorld (Camarillo), SunEarth (Fontana), Heliodyne (Richmond), FAFCO (Chico), Solyndra (Fremont), component manufacturers



Really Important Job Info

Major qualifications for installers and helpers

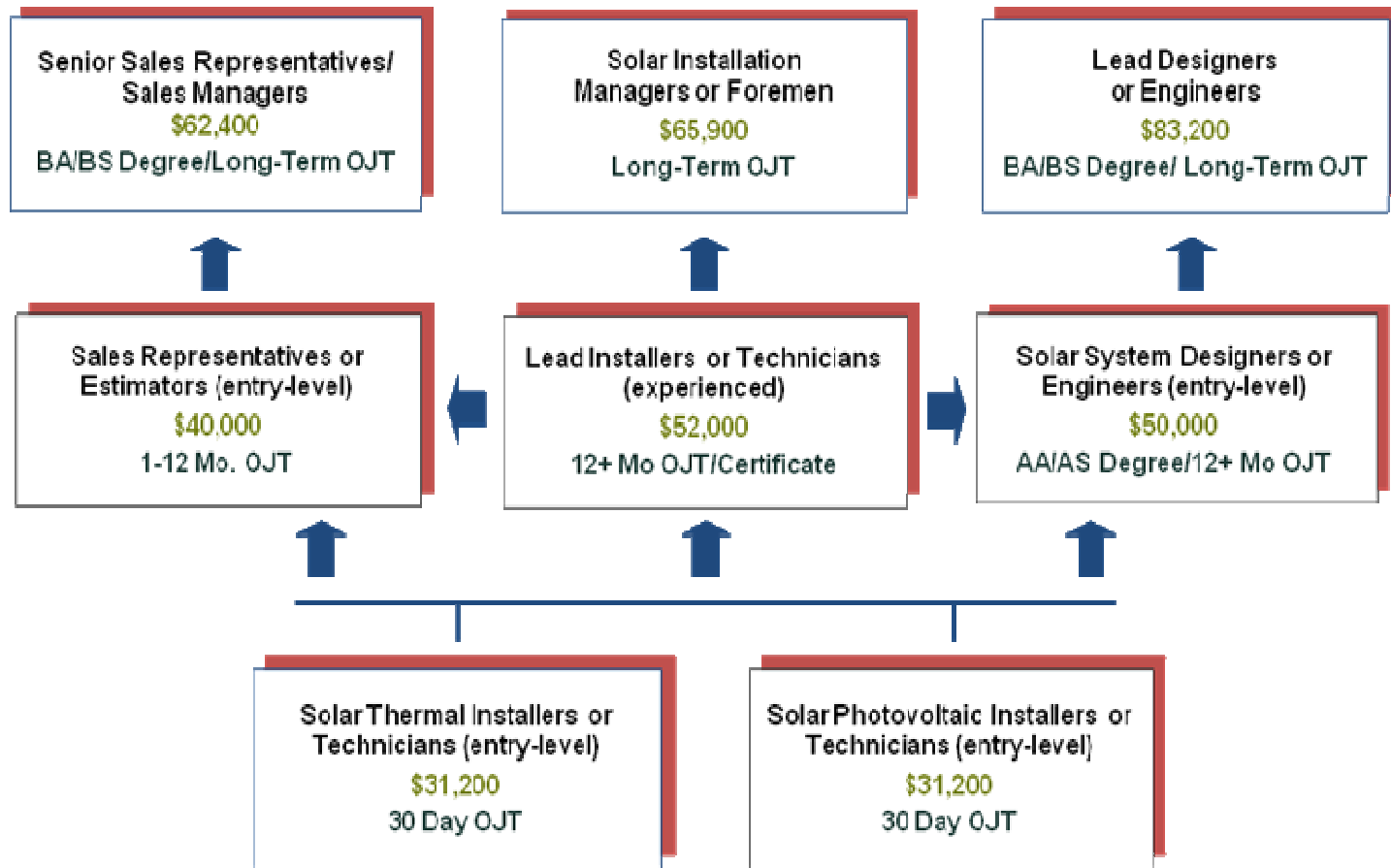
- Shows up on time
- Valid driver's license
- Not afraid of heights
- Can safely climb up and down a ladder and work on a roof
- Follows instructions accurately and safely
- Polite to customers
- Likes to work in 140° with no shade in the summer or on a cold, wet day in the winter on a steep roof
- Knowledge of technology



Other jobs seldom discussed

- Energy use assessors
- Sales and estimating
- Administration: rebate paperwork, contract processing, project scheduling
- Project management
- Inventory management
- Data processing
- Panel cleaning

Cal Community College Solar Study



Job Training – a work in progress

- Standardization
 - Lack of Standard training: an employer does not know if a graduate from School X has the training to be ready to work
 - Technology not Standardized
 - Installation not Standardized
- Pre-apprentice programs (Cypress Mandela)
- Shout out to Homeboy Industries, LAUSD/IBEW: Brian Hurd
- IBEW Apprenticeship Schools
- Community Colleges starting to standardize but the majority are focusing on PV installer training right now (but if I can help it, they will add SWH, sales, estimating, administration)



Fun Pictures



**Guess which
one is the
solar thermal
project**



Thank you!



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